BS EN 1573:2015

BSI Standards Publication

Bar code — Multi industry transport label

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National foreword

This British Standard is the UK implementation of EN 1573:2015. It supersedes BS EN 1573:1997 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee IST/34, Automatic identification and data capture techniques.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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European foreword

This document (EN 1573:2015) has been prepared by Technical Committee CEN/TC 225 "AIDC technologies", the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2016, and conflicting national standards shall be withdrawn at the latest by May 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1573:1996.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The use of electronic data interchange (EDI) in association with the physical transport and handling of goods requires a clear and unique identifier linking the electronic data and the transport unit.

Bar coded transport labels are in widespread use in European industry. There exists a number of different standards many designed to meet the requirements of the specific industry sector. For effective and economic use within, and between, industry sectors a common multi-industry standard is a necessity.

The bar code information on the transport label may be used to access the appropriate database that contains detailed information about the transport unit, including information transmitted by electronic messages. In addition a transport label may contain other information relevant to the trading partners, either encoded in bar codes or printed in a human readable format.

This edition of EN 1573, Multi Industry Standard Label (MITL), expands on the 1996 edition by providing advice on usage of a modularized multi industry transport label that fulfils both product related requirements as well as transport requirements.

This edition also includes additional alternatives for 2D symbols and informative samples of modularized MITLs.

1 Scope

This European Standard:

— specifies the general requirements for the design of transport labels containing linear bar code and two-dimensional symbols for use by a wide range of industries;

— provides for traceability of transported units via a unique transport unit identifier code or 'licence plate', and supplemented where necessary by other identified data presented both in bar code and human readable form;

— provides a choice of linear bar code and two-dimensional symbologies;

— specifies quality requirements, classes of bar code density;

— provides recommendations as to label material, size and the inclusion of free text and any appropriate graphics.

This European Standard draws considerably on the content of ISO 15394:2009. As such, common material will not be repeated here but detailed references will be provided to that standard. However, this European Standard:

— defines some features in a more precise manner for use in the European context;

— provides additional advice possible since the publication of ISO 15394:2009.

This European Standard can be used as the single source, sufficient for an overview and to enable information flows to be incorporated into business systems. ISO 15394 is more relevant to those who are undertaking detailed label design, particularly compliant label generating software.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO/IEC 15416, *Information technology - Automatic identification and data capture techniques - Bar code print quality test specification - Linear symbols (ISO/IEC 15416)*

EN ISO/IEC 15438, *Information technology - Automatic identification and data capture techniques - PDF417 bar code symbology specification (ISO/IEC 15438)*

ISO 15394:2009, *Packaging — Bar code and two-dimensional symbols for shipping, transport and receiving labels*

ISO/IEC 15417, *Information technology — Automatic identification and data capture techniques — Code 128 bar code symbology specification*

ISO/IEC 15418, *Information technology — Automatic identification and data capture techniques — GS1 Application Identifiers and ASC MH10 Data Identifiers and maintenance*

ISO/IEC 15434, *Information technology — Automatic identification and data capture techniques — Syntax for high-capacity ADC media*

ISO/IEC 15459-1, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 1: Individual transport units*

ISO/IEC 16388, *Information technology — Automatic identification and data capture techniques — Code 39 bar code symbology specification*

ISO/IEC 16022, *Information technology — Automatic identification and data capture techniques — Data Matrix bar code symbology specification*

ISO/IEC 18004, *Information technology — Automatic identification and data capture techniques — QR Code bar code symbology specification*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
unique identifier
an identifier is a character string used to uniquely identify one instance of an object within an identification scheme that is managed by an agency

3.2
licence plate
common term for unique identifier of a transport unit

Note 1 to entry: For this European Standard it is specified by the label issuer and applied to a transport unit to provide access to traceability data regardless of content and destination and valid for the lifetime of the transport unit. The term licence plate is used because of the one-to-one relationship between the number and physical transport unit.

3.3
transport unit
package intended for transportation comprising one or more articles, wrapped or unwrapped, and when multiple articles constrained to form a unit

4 General concepts

4.1 Principles

The purpose of a bar code label is – apart from unique identification of the package- to facilitate the automatic exchange of data among all members within a channel of distribution, e.g. supplier, carrier, purchaser, other intermediaries. The amount of data in linear bar code, two-dimensional symbol, and in human readable form is dependent on the requirements of the trading partners. Where a bar code label is used in conjunction with electronic databases and/or electronic message standards, the amount of data may be significantly reduced by the use of a common mandatory data element (the unique transport unit identifier).

Trading partners, have different information requirements. Some information may be common to two or more trading partners while other information may be specific to a single trading partner. Information for various trading partners becomes available at different times, e g:

— order processing information at the time of processing the order;

— product specific information at the point of manufacture or packaging;

— transport information at the time of shipment.

Trading partners can find it necessary to include additional data elements dealing with the above which may be presented both for automatic data capture from the linear bar code or two-dimensional symbol and for processing in a human readable form.

4.2 Unit load and transport package

For the purposes of this European Standard, a unit load is considered to be one or more transport packages or other items placed in a container or held together by means such as pallet, slip sheet, strapping, interlocking, glue, shrink wrap, or net wrap, making them suitable for transport, stacking, and storage as a unit.

For the purposes of this European Standard a transport package is considered to be a package intended for the transportation and handling of one or more articles, smaller packages, or bulk material. Both unit loads and transport packages are referred to as transport units in this document.

4.3 Unique transport unit identifier

A unique transport unit identifier is assigned to each individual transport unit. This is a basic requirement for all label formats specified by this European Standard. The unique identifier or "licence plate" is the key providing access to information stored in computer files and it may be transmitted by electronic communication between trading partners. The unique identifier may be used by all of the trading partners to retrieve information about the transport unit itself or about the status of the physical movement of the transport unit along the supply chain. It enables systems to track and trace individual transport units.

5 Data elements

5.1 Data identifiers

Data elements in the linear bar codes shall include data identifiers in accordance with ISO/IEC 15418.

GS1 application identifiers (in accordance with ISO/IEC 15418) shall only be used in conjunction with GS1 subset of Code 128 symbology (in accordance with ISO/IEC 15417).

ASC MH10 Data Identifiers (in accordance with ISO/IEC 15418) shall be used in conjunction with either Code 39 symbology (in accordance with ISO/IEC 16388) or Code 128 symbology or QR Code symbology (in accordance with ISO/IEC 18004) or Data Matrix (in accordance with ISO/IEC 16022).

NOTE ISO 15394 refers to these data identifiers by their previous name of FACT data identifiers. They are now a formal ANSI standard, and maintained by American and international experts from other countries.

Users should become familiar with the issues associated with being confronted with the multiple symbologies and data formats. These issues are discussed in Annex B of ISO 15394:2009.

5.2 Unique transport unit identifier

The unique transport unit identifier, as defined in ISO/IEC 15459-1, shall be present on the multi industry transport label. The unique transport unit identifier has the following structure, it:

— starts with the Issuing Agency Code (IAC), assigned to the Issuing Agency by the Registration Authority;

— conforms to a format specified by the Issuing Agency;

— is unique in the sense that no issuer re-issues a number until a sufficient period of time has passed so that the first number has ceased to be of significance to any user of this European Standard;

— contains only numeric and uppercase alphabetic characters (not including lower case characters or punctuation marks);

— does not contain more than 20 characters;

— does not contain more characters than identified in 7.3.4 (Table 1) of ISO 15394:2009.

A unique transport unit identifier shall be assigned to each individual transport unit. The unique transport unit identifier shall be represented in one of the following formats:

— The unique transport unit identifier beginning with an alphabetic IAC. This should be preceded by the ASC MH10 Data Identifier "J"; or may be preceded by other appropriate data identifiers in the "J" series, provided that the choice is clearly specified in an application standard or by an Issuing Agency. This complete string shall be encoded in either Code 39 or Code 128.

— The GS1 Serial Shipping Container Code (SSCC), effectively the unique transport unit identifier beginning with a numeric IAC. This shall be preceded by the GS1 application identifier "00". This complete string shall be encoded in ISO compliant Code 128 symbol.

Annex A shows example labels that comply with this requirement.

ISO 15394 permits the use of data encoded in two linear bar codes, using different data identifiers, to be combined to create the unique transport unit identifier. This practice shall not be compliant with this European Standard.

NOTE ISO 15394 was developed based on rules originally defined in EN 1572, which only supported the use of the unique transport unit identifier as a single contiguous data string.

5.3 Basic shipping, transport and receiving data elements

In addition to the unique transport unit identifier, the following information (as defined in 4.4.1 of ISO 15394:2009) should be provided on the transport label:

— "Ship to" name and address (for shipment delivery).

— "Ship from" name and address (to be able to return the shipment in the event that delivery was not possible).

— Key to carrier's database (if the unique transport unit identifier is not this data element).

— Key to customer's database (if the unique transport unit identifier is not this data element).

These data elements are defined in 5.2.2 to 5.2.5 of ISO 15394:2009. A.2 shows example labels that comply with this recommendation. A.3 shows example labels that support additional encoded data, with the mutual agreement of trading partners.

5.4 Structured data files

5.4.1 General

Structured data files, such as documentation supporting the handling of the transport units or complete EDI messages, may be included, for example, delivery note, quality certificate, insurance certification. High capacity two-dimensional symbols shall be used to represent this data, as described in the following sub-clauses.

5.4.2 Shipping and receiving data

It is possible to combine all the data from the linear bar codes on the multi-industry transport label additional into one single two-dimensional symbol to facilitate more efficient data capture. This symbol may also incorporate additional data not represented in the linear bar codes on the transport label (e.g. data represented in text). When this data are presented in a two-dimensional symbol, PDF417 symbology (as defined in EN ISO/IEC 15438) or QR Code (as defined in ISO/IEC 18004) or Data Matrix (as defined in ISO/IEC 16022) shall be used with the following conditions:

— macro PDF417 shall not be used, and

— compact PDF417 shall not be used.

The structure and syntax of the encoded message shall conform to ISO/IEC 15434.

The basic requirement of this European Standard, to provide the unique transport unit identifier in a linear bar code (see 5.2), still persists with the use of PDF417 or QR Code or Data Matrix. The unique transport unit identifier may be additionally encoded in the PDF417 or QR Code or Data Matrix symbol, so that all the data can be captured from that symbol.

ISO 15394:2009, D.2 provides additional technical specifications for the use of PDF417 symbols for encoding shipping and receiving data as part of a transport label. These requirements apply to this European Standard whenever the PDF417 or QR Code or Data Matrix symbology is used for encoding shipping and receiving data.

ISO 15394:2009, D.4 provides advice on features to consider in the design and printing of labels that incorporate PDF417 or QR Code or Data Matrix symbols. These are relevant in determining the parameter values used to produce the symbol.

5.4.3 Supporting documentation application

The transport of goods often requires supporting documentation to be provided such as a bill of lading, manifest, packing slip, customs data, or information that might be transmitted in EDI or other message formats. In some systems, there is an advantage of having this supporting documentation incorporated as an item-attendant two-dimensional symbol on the transport label. For example, this could facilitate the immediate processing of a transport unit because the relevant “documentation” can be scanned by a transport company or at the point of receipt.

Whenever this type of message is presented in a two-dimensional symbol, PDF417 (as defined in EN ISO/IEC 15438) or QR Code or Data Matrix should be used. The structure and syntax of the encoded message shall conform to ISO/IEC 15434.

ISO 15394:2009, D.3 provides additional technical specifications for the use of PDF417 or QR Code or Data Matrix symbols for encoding supporting documentation data as part of a transport label. These requirements apply to this European Standard whenever the PDF417 or QR Code or Data Matrix symbology is used for encoding supporting documentation data.

ISO 15394:2009, D.4 provides advice on features to consider in the design and printing of labels that incorporate PDF417 or QR Code or Data Matrix symbols. These are relevant in determining the parameter values used to produce the symbol.

5.4.4 Carrier sorting and tracking applications

Automated Sorting is a process where transport units are automatically sorted and routed in a warehouse or distribution centre.

Tracking is a process by which physical events related to the transport unit are recorded in databases.

Data to be encoded include any data that are required to route transport units between multiple points, locate transport units, and other supporting data which is relevant to sorting and/or tracking for internal and external processing.

When a two-dimensional symbol is used for the carrier sorting and tracking applications, 2D symbols like the QR Code, Data Matrix and MaxiCode symbology (as defined in ISO/IEC 16023) are capable of being read in a high-speed scanning environment. The structure and syntax of the MaxiCode symbols for the carrier sorting and tracking applications shall conform to the structure and syntax described in ISO/IEC 15434.

ISO 15394:2009, Annex C provides additional technical specifications for the use of MaxiCode symbols as part of a transport label. These requirements apply to this European Standard whenever the MaxiCode symbology is used for carrier sorting and tracking applications.

5.5 Data area identification

In practice, fully automated communication channels which make it possible to rely exclusively on electronic files for retrieving information on the movements of the transport units are not always available. For this reason, there is a need to indicate relevant information on the transport labels themselves, in addition to their identification. The various fields can be placed in relevant data areas. ISO 15394 defines a number of these that may be used.

These data areas, whether containing bar code or human readable information shall be identified with the corresponding data area title. The data area title may include the relevant application identifier or data identifier.

6 Human readable information

6.1 Human readable interpretation

A human readable interpretation of each linear bar code symbol shall be provided adjacent to the bar code to provide a fall back key entry and a diagnostic, trouble shooting and maintenance facility. Such human readable interpretation shall represent the encoded data.

6.2 Human translation

Where human translation of bar code information is required, for example for data encoded in a two-dimensional symbol, this shall be provided in a separate section of the label.

6.3 Free text and data

Human readable information, not being a translation of the bar coded information, may be provided according to the requirements of the trading partners.

7 Data carriers

7.1 Linear bar code symbols

7.1.1 Symbology

The linear bar code symbologies shall be one of the following:

— Code 39 in accordance with ISO/IEC 16388.

— Code 128 in accordance with ISO/IEC 15417.

7.1.2 Symbol height

The minimum bar height of a bar code symbol shall be 1,27cm.

7.1.3 Narrow element dimension

The minimum narrow element dimension (x-dimension) shall not be less than 0,25 mm. The x-dimension for Code 39 and Code 128 symbols should be in the range of 0,25 mm to 0,43 mm as determined by the printing capability of the supplier/printer of the label.

In the case that fewer characters are required than specified in ISO 15394:2009, Table 1 (7.3.4), a larger x-dimension may be used as long as the bar code print quality requirements specified in 7.1.8 and label width recommendations are met.

NOTE Symbols with the x-dimension at the lower end of this range, specifically 0,25 mm to 0,33 mm, may require special care in order to meet the quality requirements.

7.1.4 Wide-to-narrow ratio for Code 39 symbols

The wide-to-narrow ratio (N) of elements of Code 39 symbols should be 3,0:1. The measured ratio shall be between 2,4:1 and 3,2:1.

7.1.5 Quiet zones

Linear bar code symbols should be printed with leading and trailing quiet zones not less than 6,4 mm. Where the x-dimension is greater than 0,64 mm, the quiet zones shall not be less than 10 times the x-dimension. The label registration parameters of the printer being used should be taken into consideration in order to ensure the minimum quiet zones.

7.1.6 Orientation

Linear bar code symbols should be presented on transport units with the bars vertical (picket fence orientation). Subject to agreement between trading partners, bars may be presented horizontally (ladder orientation).

7.1.7 Placement

When multiple linear bar codes are used they should be placed in a way that ensures that they do not interfere with each other when scanned.

No more than two linear symbols should appear side by side on a label. If two linear symbols are placed side by side, the symbols should be placed so that they are not in the same linear plane, to reduce the possibility of interference with successful bar code scanning.

7.1.8 Linear bar code symbol print quality

The quality of the printed linear bar code symbol shall be in accordance with EN ISO/IEC 15416. The minimum symbol grade shall be 1,5/10/660 where:

— minimum print quality grade at point of production = 1,5(c);

— measurement aperture = 0,254 mm;

— inspection wavelength = (660 ± 10) nm.

It is important that the linear bar codes be decodable throughout the system of use. For this reason, quality tests should not be limited to label production inspection but also should be followed through to the end use. The above symbol quality and measurement parameters ensure scannability over a broad range of scanning environments. Labellers should not be required to guarantee the print quality of a

label when it is received by the customer. Print quality at the point of production should be higher than the requirement at the point of use.

Unattended scanning may require a higher print quality grade than identified above. Consequently, those implementing this European Standard for unattended scanning applications should discuss print quality requirements with trading partners.

It may not be possible to meet the print quality requirements of this European Standard when printing directly onto coloured fibreboard surfaces. Users considering the printing of bar code symbols directly on to coloured fibreboard surfaces should consider the scanning capabilities of their entire trading channel.

7.2 Two-dimensional symbols

If more data are required to be encoded than can be accommodated with linear bar code symbols on the label, two-dimensional symbols should be used additionally, with the identification key encoded in the linear symbol.

This European Standard supports the two-dimensional symbologies: MaxiCode, PDF417 QR Code and Data Matrix. This European Standard recommends MaxiCode, Data Matrix or QR Code for carrier sorting and tracking applications and PDF417, Data Matrix or QR Code for other applications covered by this European Standard and ISO 15394. For further information and guidance in the use of two-dimensional symbols, see Annex C, D.2 and D.3 of ISO 15394:2009.

8 Label design

8.1 General

The unique transport unit identifier shall be encoded in a linear bar code, and shall be printed in the lowest area of the label. Other data elements, as defined in Clause 5, should be included based on the needs of all the trading partners in the supply chain, including those responsible for the transport and distribution of the transport unit.

The design of the label is the responsibility of the industry or trading partners concerned and should take account of the following elements:

— the size and number of linear bar codes and two dimensional symbols;

— the size and number of human readable items of information;

— free text;

— graphics, e.g. safety, hazard, quality signs (see 8.2);

— logos, e.g. supplier's logo.

ISO 15394 provides additional advice about grouping related data together in zones or segments, e.g. for carriers, customers, and suppliers (7.1 of ISO 15394:2009). This is not a requirement for this European Standard, but may be adopted by mutual agreement. Other layout advice is provided in 7.2 of ISO 15394:2009.

8.2 Mandated data and graphics

This European Standard does not supersede or replace any applicable safety or regulatory marking or labelling requirements. This European Standard is to be applied in addition to any other mandated labelling requirements. Free areas or certain graphics, such as safety, hazard, quality signs or logos may be required.

8.3 Dimensions

The width of the label should be 105 mm or 148 mm or 210 mm. The height of the label shall be specified by the user. ISO 15394:2009 provides in 7.3.4 advice about dimensional features for the different linear bar code symbols at various x-dimension values and numbers of encoded characters. This advice is useful for setting the design parameters of labels.

8.4 Materials

Label material and the method of attaching the label to the transport unit shall be selected to ensure that the label:

— remains attached to the transport unit for the intended life of the label;

— remains readable for the life of the label;

— survives the environments for the life of the label, for example: contamination, heat, light, moisture;

— meets disposability requirements.

9 Optional requirements

Labels should be affixed at a suitable location where there is a minimum risk of damage. Labels should be placed on the side of the transport unit with the human readable information parallel to the natural bottom of the transport unit. The edge of the label(s) should be a minimum of 2cm from any transport unit edge.

Each transport unit should at the minimum have one label. For pallets it is recommended that two sides of the item are labelled with the exact same data, to ensure one label is always visible (e.g. pallets that are stored either long or short edge facing). Parcel carriers may require the placement of carrier information on the top of a transport unit.

10 Other advice in ISO 15394

10.1 General

ISO 15394 provides useful additional advice, which is described below.

10.2 Advice for those drafting application standards

ISO 15394:2009, Annex A contains advice useful to those drafting application standards for specific industries, or for large scale bi-lateral implementations. Designers of software for printing labels can also use this information to ensure that systems features have been taken into account.

10.3 Advice on the use of multiple symbologies

ISO 15394:2009, Annex B contains advice about discriminating between symbologies, either to select only a single option for scanning or for intentional scanning of multiple options. This advice is useful to those setting up scanning systems.

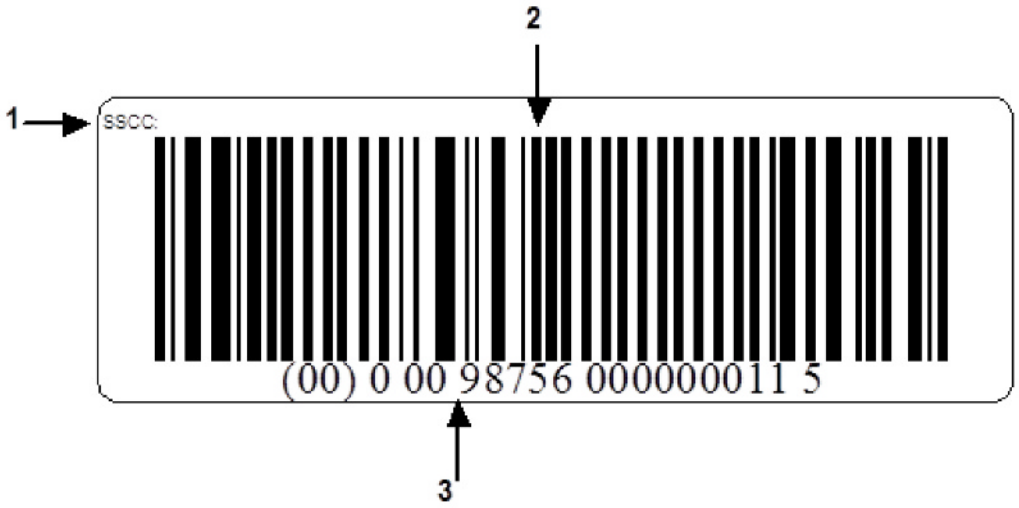
The same annex also provides advice about migration paths from one linear symbology/identifier configuration to another. Specific, and separate, advice is offered to the responsible industry body, producers of labels and those scanning the bar codes

Annex A
(informative)

Example labels

A.1 Example labels: minimum requirement of mandatory bar code for unique identifiers

At a minimum, one of the two following formats (shown in Figures A.1 or A.2) are required as defined in 5.2.



Key

1 = field title

2 = symbol representation of unique transport unit identifier

3 = human readable representation of unique transport unit identifier

NOTE This figure is not to scale.

Figure A.1 — Base label using the GS1 application identifier "00" for unique transport unit identifier

Key

1 = field title

2 = symbol representation of unique transport unit identifier

3 = human readable representation of unique transport unit identifier (KFR5722196721234567)

NOTE This figure is not to scale.

Figure A.2 — Base label using the data identifier "J" for unique transport unit identifier

A.2 Example labels with the recommended transport data

When, with the mutual agreement of the trading partners, pointers to the carrier's or customer's databases are needed, the formats shown in Figures A.3 and A.4 are examples that comply with 5.3 of this European Standard.

Key

1 = ship to and ship from

2 = transport instructions

3 = routing code

4 = GS1 application identifier “00” for unique transport unit identifier

NOTE This figure is not to scale.

Figure A.3 — Label with GS1 application identifier “00” and pointers to carrier’s and customer’s databases

Key

1 = sender

2 = recipient

3 = pointer to carrier's database

4 = pointer to recipient's database

5 = data identifier "J" for unique transport unit identifier

NOTE This figure is not to scale.

Figure A.4 — Label with data identifier "J" and pointers to carrier's and customer's databases

A.3 Example labels with additional data by mutual agreement

When, with the mutual agreement of the trading partners, data additional to the pointers to the carrier's or customer's databases are needed, the formats shown in Figures A.5 to A.7 are examples that satisfy the recommendations of this European Standard and a mutual agreement.

Key

1 = ship to and ship from

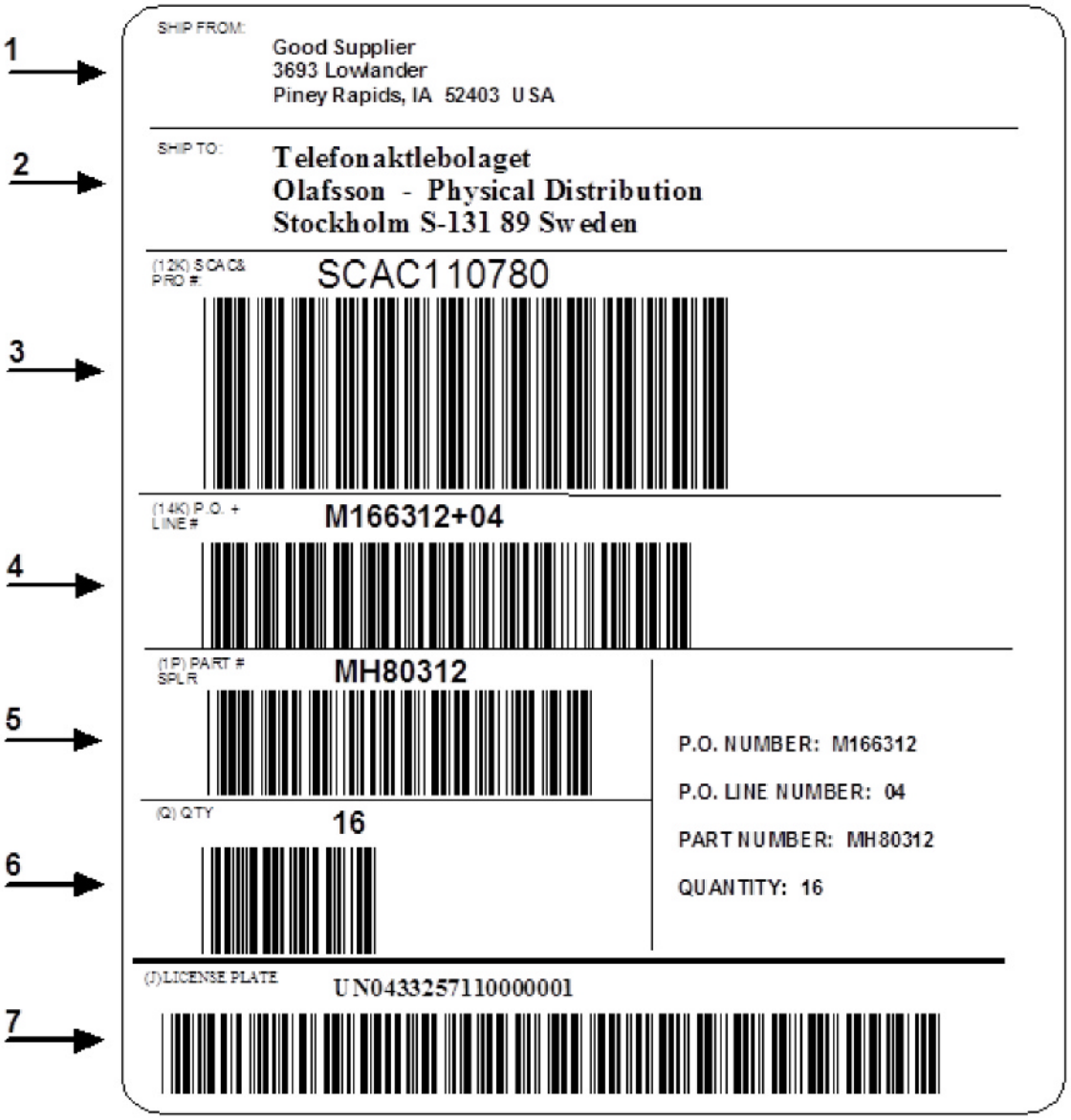
2 = transport instructions

3 = GTIN of trade items contained in a logistic unit

4 = GS1 application identifier “00” for unique transport unit identifier

NOTE This figure is not to scale.

Figure A.5 — Label with GS1 Application Identifier AI (00), pointers to carrier’s and customer's databases and additional mutually agreed data



Key

1 = ship from

2 = ship to

3 = pointer to carrier's database

4 = pointer to customers database

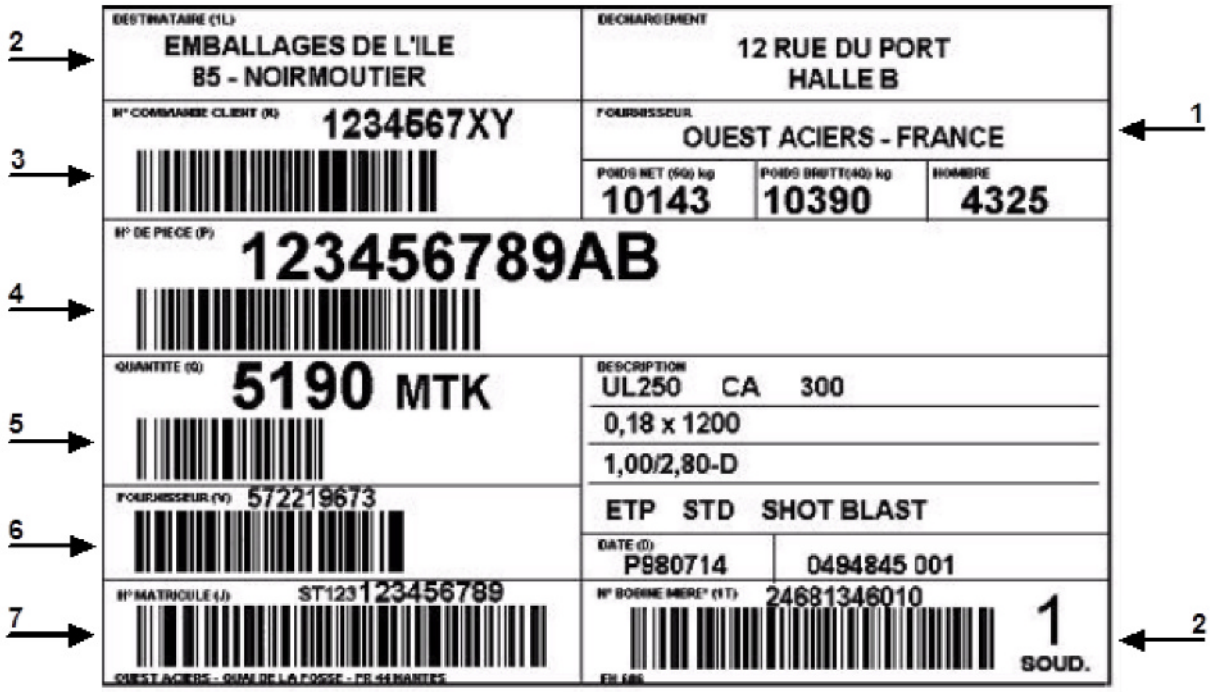
5 = mutually agreed additional data

6 = mutually agreed additional data

7 = data identifier "J" for unique transport unit identifier

NOTE This figure is not to scale.

Figure A.6 — Label with data identifier "J", pointers to carrier's and customer's databases and additional mutually agreed data



Key

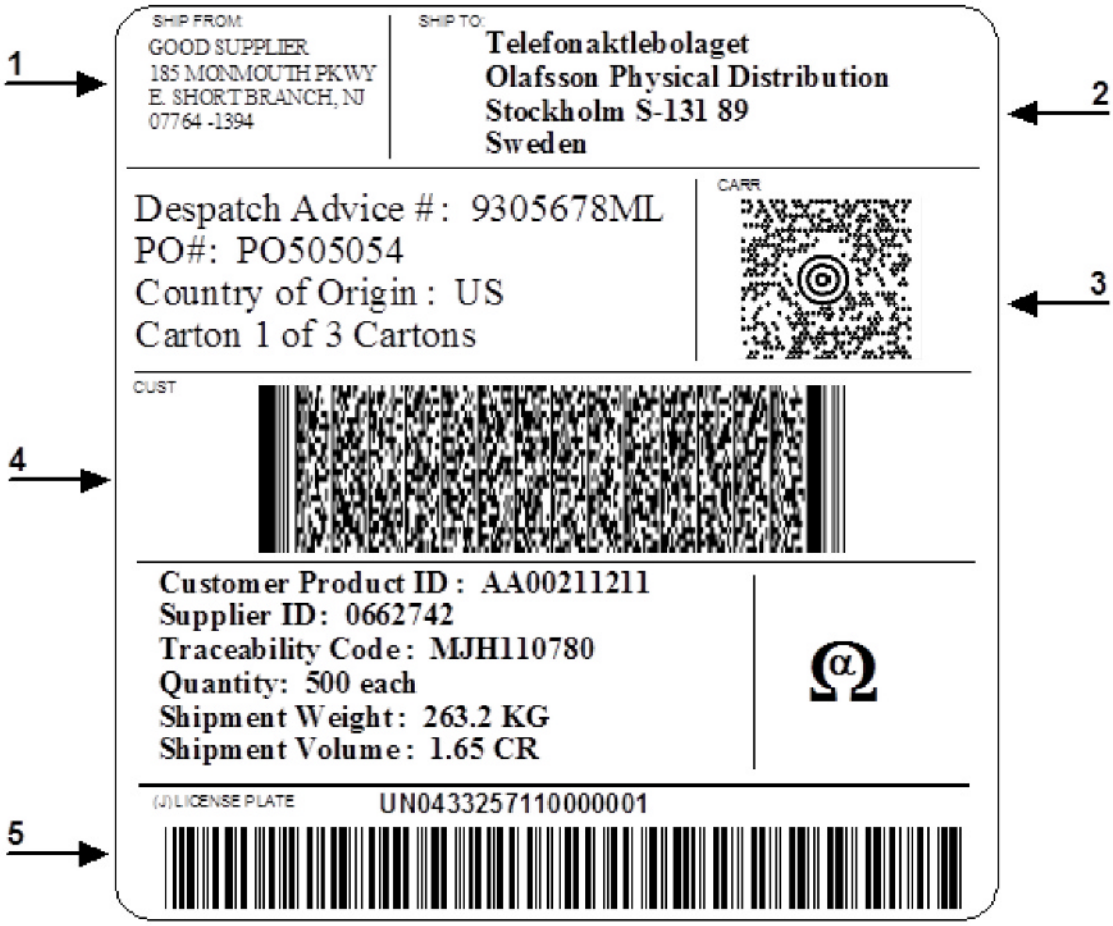
1 = sender
2 = recipient
3 = pointer to recipient's database
4 = mutually agreed additional data
5 = mutually agreed additional data
6 = sender (coded)
7 = data identifier "J" for unique transport unit identifier
8 = mutually agreed additional data

NOTE This figure is not to scale.

Figure A.7 — Steel industry label to EN 606, with data identifier "J" and pointers to customer's databases and additional mutually agreed data

A.4 Example label with data encoded in two-dimensional symbols

When, with the mutual agreement of the trading partners, trading partner data in 2D symbols are needed, the format shown in Figure A.8 is an example that satisfies the recommendation of this European Standard and a mutual agreement. Although the illustration shows both recommended two-dimensional symbologies, the mutual agreement may call for one or the other to meet the functions defined in 7.2. Users should be aware that different scanners will be needed to scan two-dimensional symbols, unless their existing scanners already read 2D symbols.



Key

1 = sender

2 = recipient

3 = MaxiCode symbol for carrier sorting/tracking

4 = PDF417 symbol for recipient's or customer's data (Optionally QR Code or Data Matrix might be used)

5 = data identifier "J" for unique transport unit identifier

NOTE This figure is not to scale.

Figure A.8 — Label with data identifier "J" and additional mutually agreed data in 2D symbols

A.5 Example of a modularized label

Current supply and distribution chains frequently involve several parties and several sequential handling steps during the life cycle of a transport unit. This modularized label is created to support complex supply and distribution chains. The following requirements have been taken into consideration:

— Solution if not all information is available for printing a full label at one time. Shipment and transport information can be generated after the first labelling process with a primary packaging label.

— Full traceability of the transport unit from the point of creation (manufacturing or packaging) to consumption via several handling parties.

— Support for several delivery processes between different parties, referring to different underlying orders.

— Support for several transport legs and transport service providers during one delivery.

— Support for rerouting of goods (transport units) during the transport process.

The modularized label consists of three information modules, see Figure A.9, below. Each module gathers information that is available and requested at different steps, according to 4.1. The purpose and information content of the different modules is:

1) Packaging label module. Containing information available at manufacturing or packaging, e.g. product and packaging information and the unique licence plate.

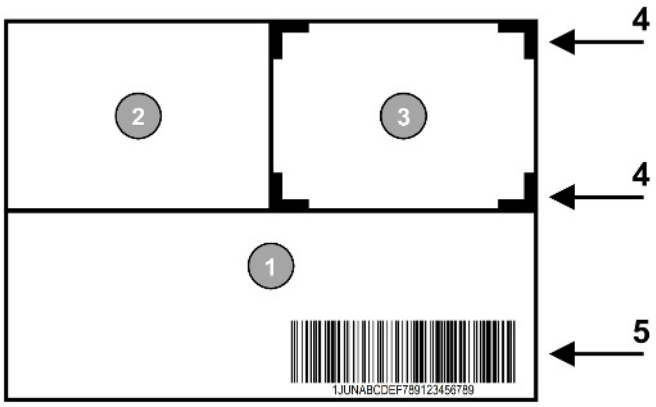
2) Delivery label module. Containing order and delivery unique information, e.g. ship from and ship to related information and additional data keys to the customer's database.

3) Transport label module. Containing information related to the transport service, e.g. the ship to name and address for the specific transport assignment, data keys to the carrier's database and other transport related information.

The packaging label (1) should not be replaced during the life cycle of the package (transport unit). The other two modules might be updated by replacement label(s) pasted over the former.

This label layout utilizes both human readable as well as linear and 2D barcode symbols.

The modularized labels will be formatted according to industry requirements. The preferred two options are the A5 format with horizontal orientation (see Figure A.9) or with vertical orientation (see Figure A.10). Reasons for printing the modularized label horizontal or vertical orientations are printing devices which might be available in different print widths and/or usage of label holders.



Key

1 = packaging label module, size: 210 × 74 mm

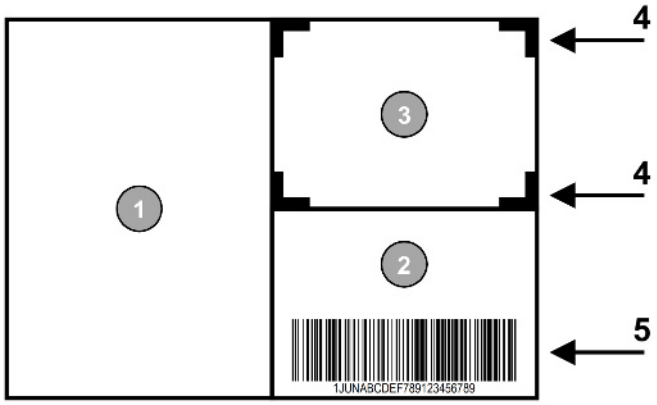
2 = delivery label module, size: 105 × 74 mm

3 = transport label module, size: 105 × 74 mm

4 = corner marks for Transport label guidance

5 = bar code with unique transport unit identifier

Figure A.9 — Overview of the modularized multi industry transport label in A5 format, horizontal orientation



Key

1 = packaging label module, size: 105 × 148 mm

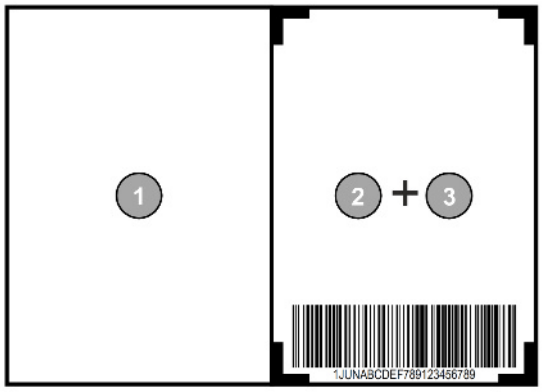
2 = delivery label module, size: 105 × 74 mm

3 = transport label module, size: 105 × 74 mm

4 = corner marks for Transport label guidance

5 = bar code with unique transport unit identifier

Figure A.10 — Modularized multi industry transport label with three label modules, vertical orientation

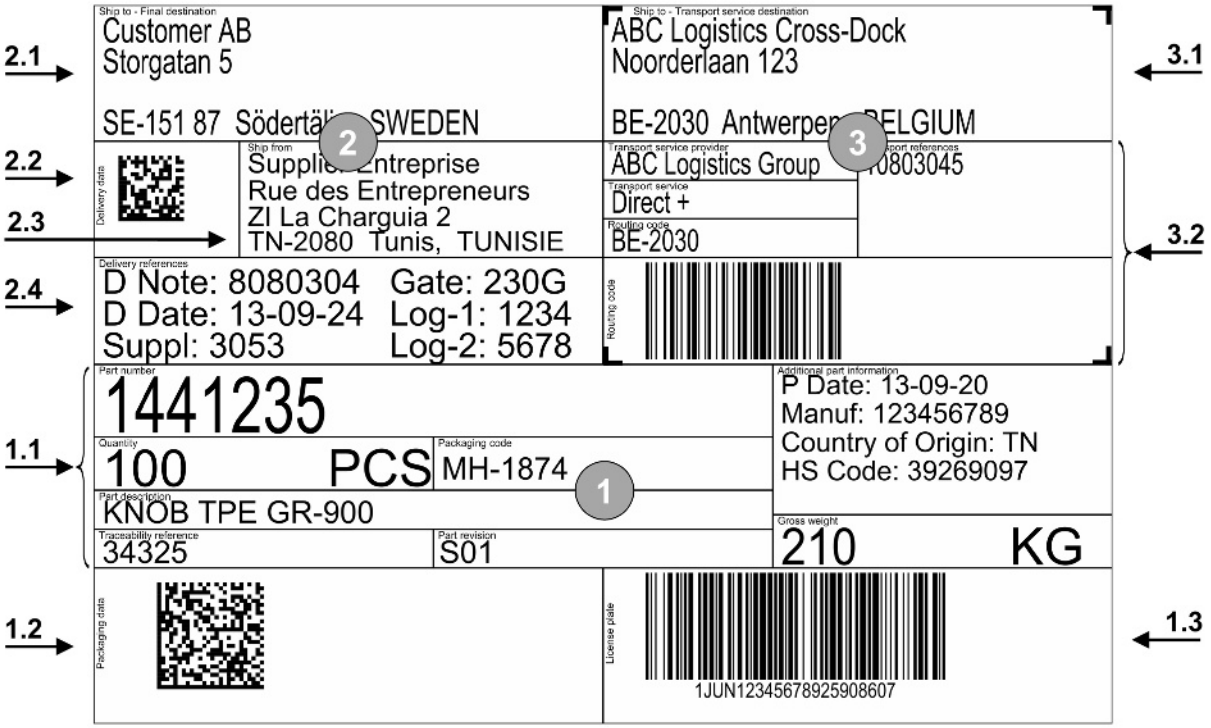


Key

1 = packaging label module, size: 105 × 148 mm

2 + 3 = combined Delivery and transport label module, size: 105 × 148 mm

Figure A.11 — Modularized multi industry transport label with two label modules, vertical orientation



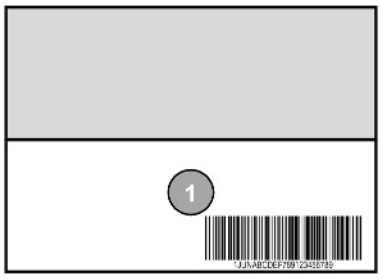
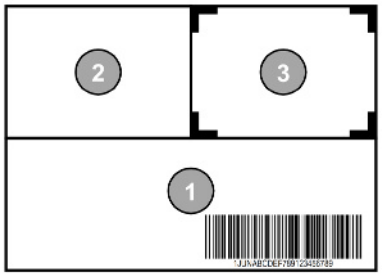
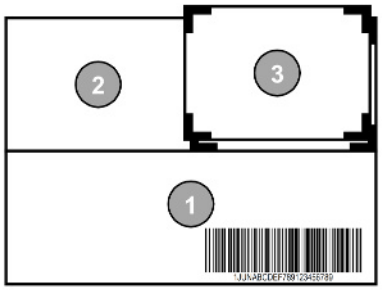
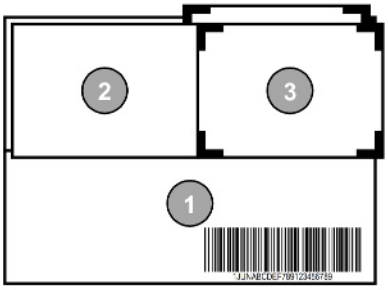
Key

1 =	packaging label module, size: 210 × 74 mm
1.1 =	product and packaging related information in human readable format
1.2 =	product and packaging related information in 2D symbol format
1.3 =	bar code with unique transport unit identifier
2 =	delivery label module, size: 105 × 74 mm
2.1 =	recipient in human readable format
2.2 =	delivery related information (e.g. order no, delivery note no, logistics references) in 2D symbol format
2.3 =	sender
2.4 =	delivery related information (e.g. order no, delivery note no, logistics references) in human readable format
3 =	transport label module, size: 105 × 74 mm
3.1 =	destination of the transport service in human readable format
3.2 =	transport related information in human readable and barcode format

Figure A.12 — Example of the modularized multi industry transport label with three label modules in A5 format, horizontal orientation

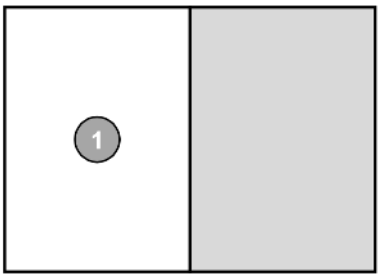
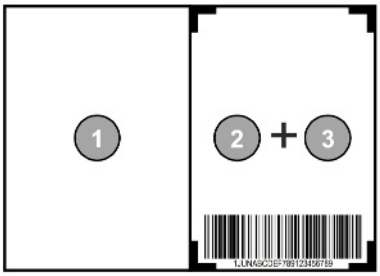
Application of the modularized multi industry transport label with vertical orientation in different supply chain scenarios is outlined in Table A.1.

Table A.1 — Example of application of the modularized multi industry transport label with vertical orientation

Process step	**Labelling scenario**
Creation of the package (in manufacturing or packing) Printing and attaching the **Packaging label (1)** to the package (transport unit) before despatch.	
At despatch Printing and attaching the **Delivery label (2)** and the **Transport label (3)**.	
Cross docking (e.g. shifting transport service provider) If needed: Re-labelling with a new **Transport label (3)**.	
At despatch from the second party Printing and attaching a new **Delivery label (2)** and a new **Transport label (3)**.	

Application of the modularized multi industry transport label with horizontal orientation in different supply chain scenarios is outlined in Table A.2.

Table A.2 — Example of application of the modularized multi industry transport label with horizontal orientation

Process step	**Labelling scenario**
Creation of the package (in manufacturing or packing) Printing and attaching the **Packaging label (1)** to the package (transport unit) before despatch.	
At despatch Printing and attaching a combined **Delivery and transport label (2 + 3)**.	

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[2] ISO/IEC 15459-2:2015, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 2: Registration procedures*

[3] ISO/IEC 16023, *Information technology — International symbology specification — MaxiCode*

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